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Cogliandro

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(54) **SLIP RESISTANT SHOELACE AND CORD**

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A43C 9/00 (2006.01)

(52) **U.S. Cl.**
CPC ***A43C 7/005*** (2013.01); ***A43C 9/00*** (2013.01)

(58) **Field of Classification Search**
CPC A43C 7/005; A43C 9/00
See application file for complete search history.

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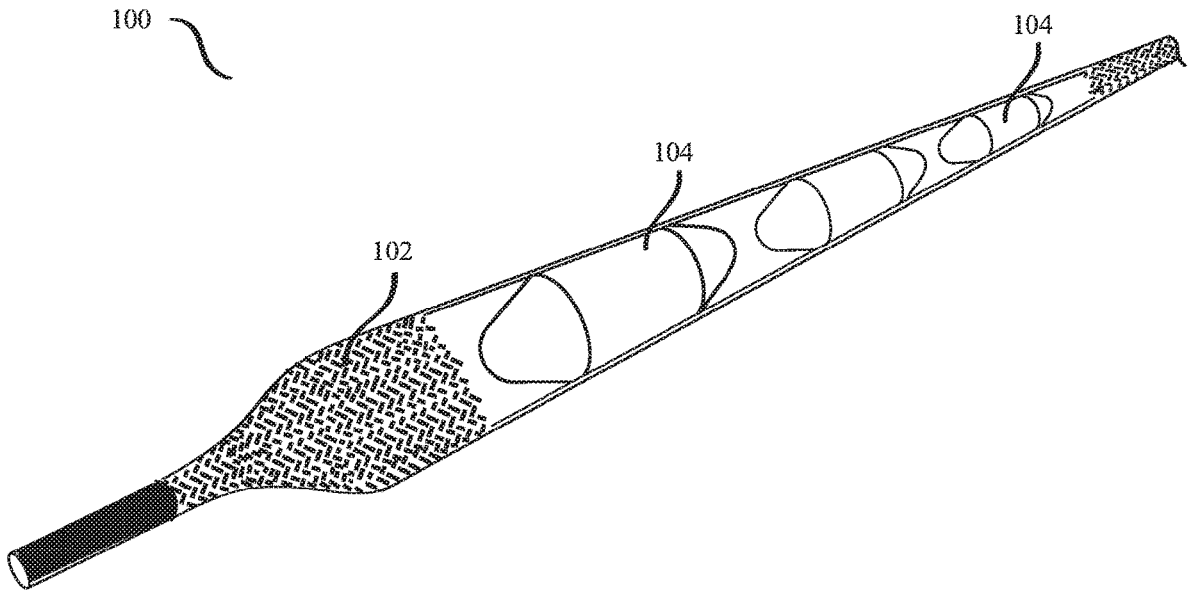
(57) **ABSTRACT**

The present invention is for a slip resistant shoelace comprising a shoelace tube and one or more friction inducing features such as a plurality of bumps made of rubber or silicone disposed over at least a portion of the length of the shoelace tube. The bumps can also be disposed over a rope in any desired manner to make it a slippage resistant rope. The plurality of bumps, when come in contact with each other or with any other surfaces in a tied knot, offer higher co-efficient of friction and thus resist slipping of the knot. A knot tied with the slip-resistant shoelace or the slip-resistant rope prevents slipping and prevents from getting loosened and untied inadvertently.

14 Claims, 12 Drawing Sheets



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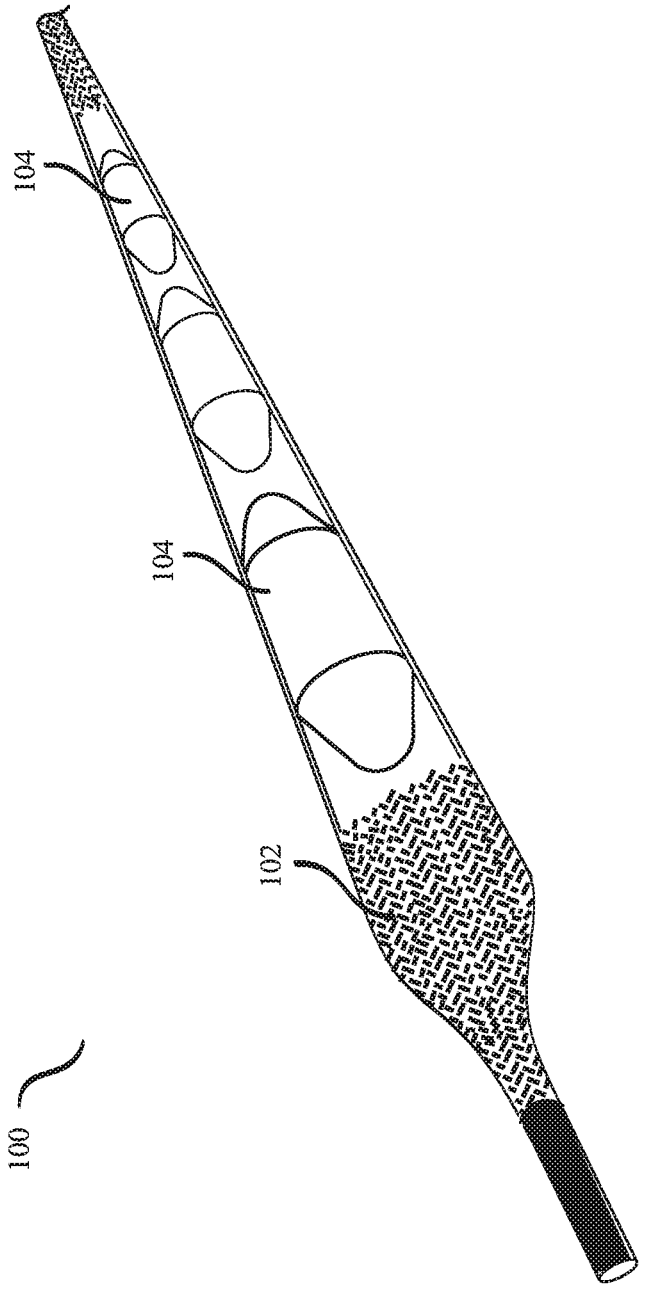

FIG.1

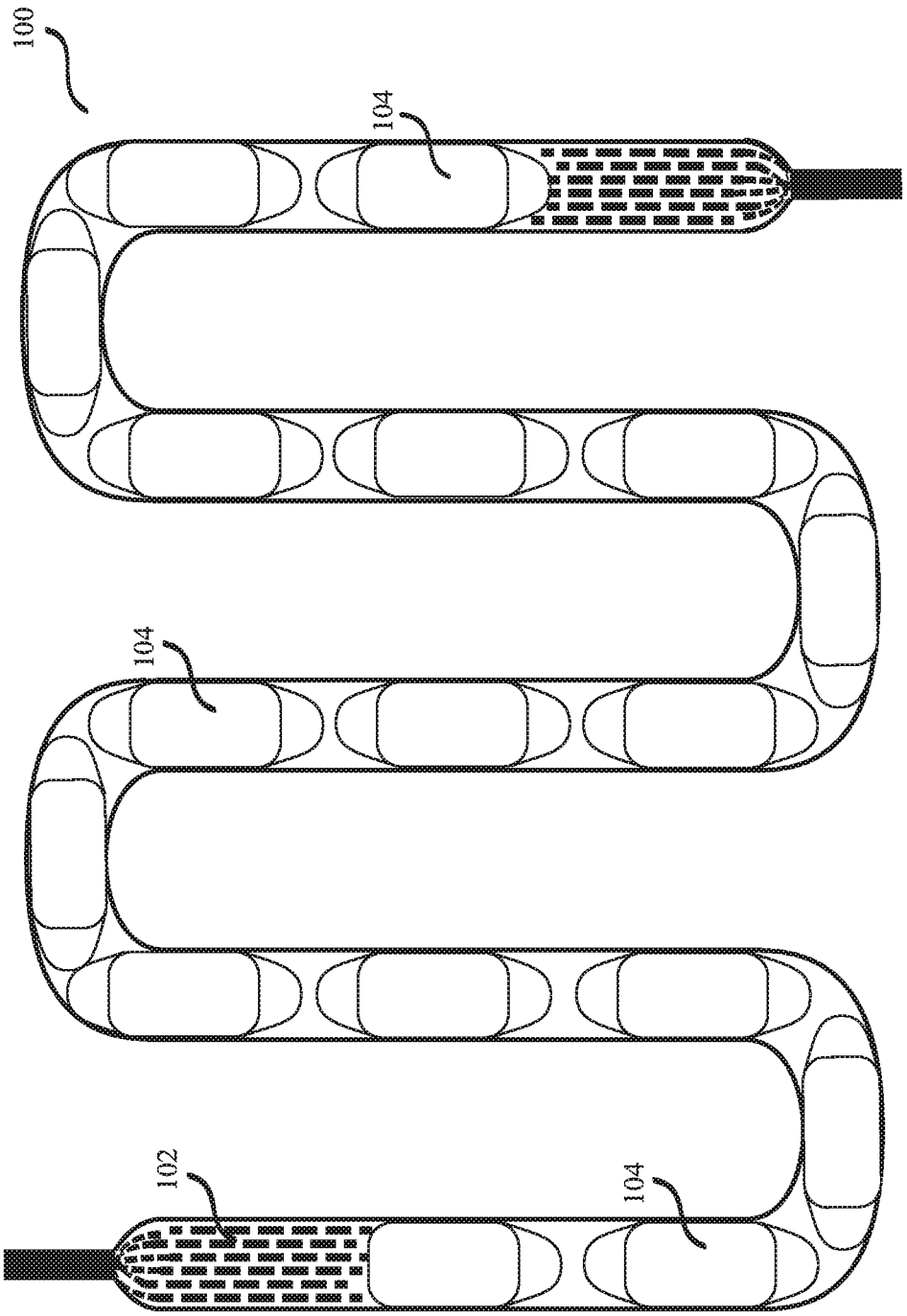

FIG.2

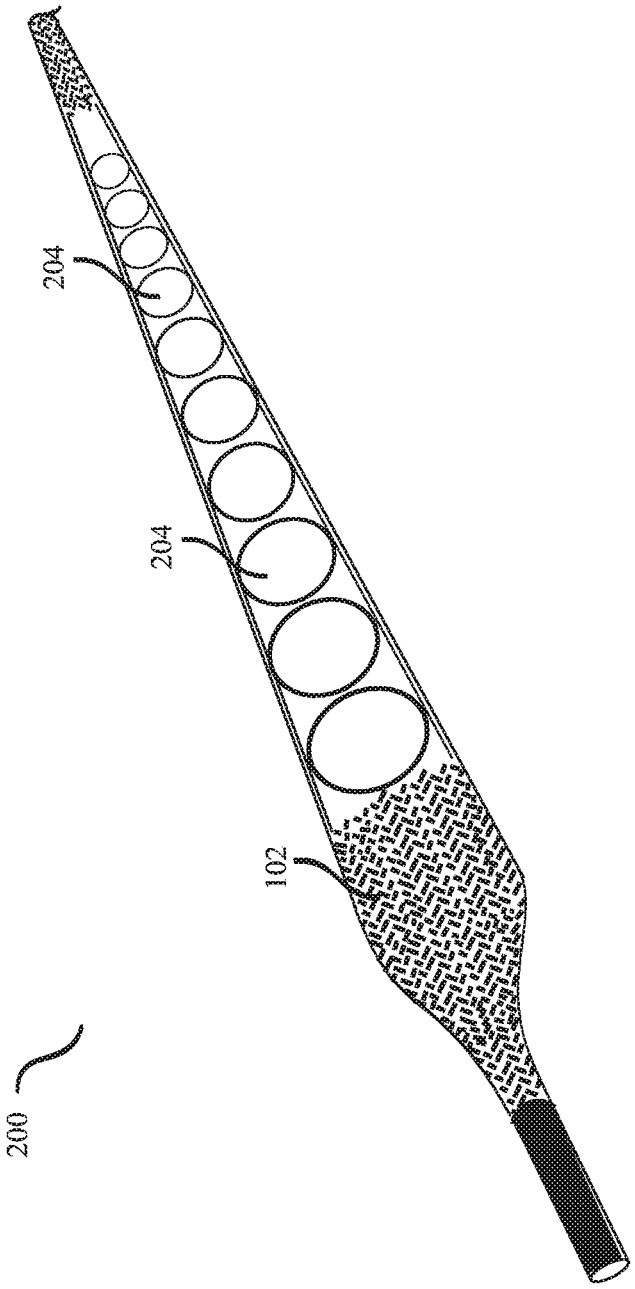

FIG.3

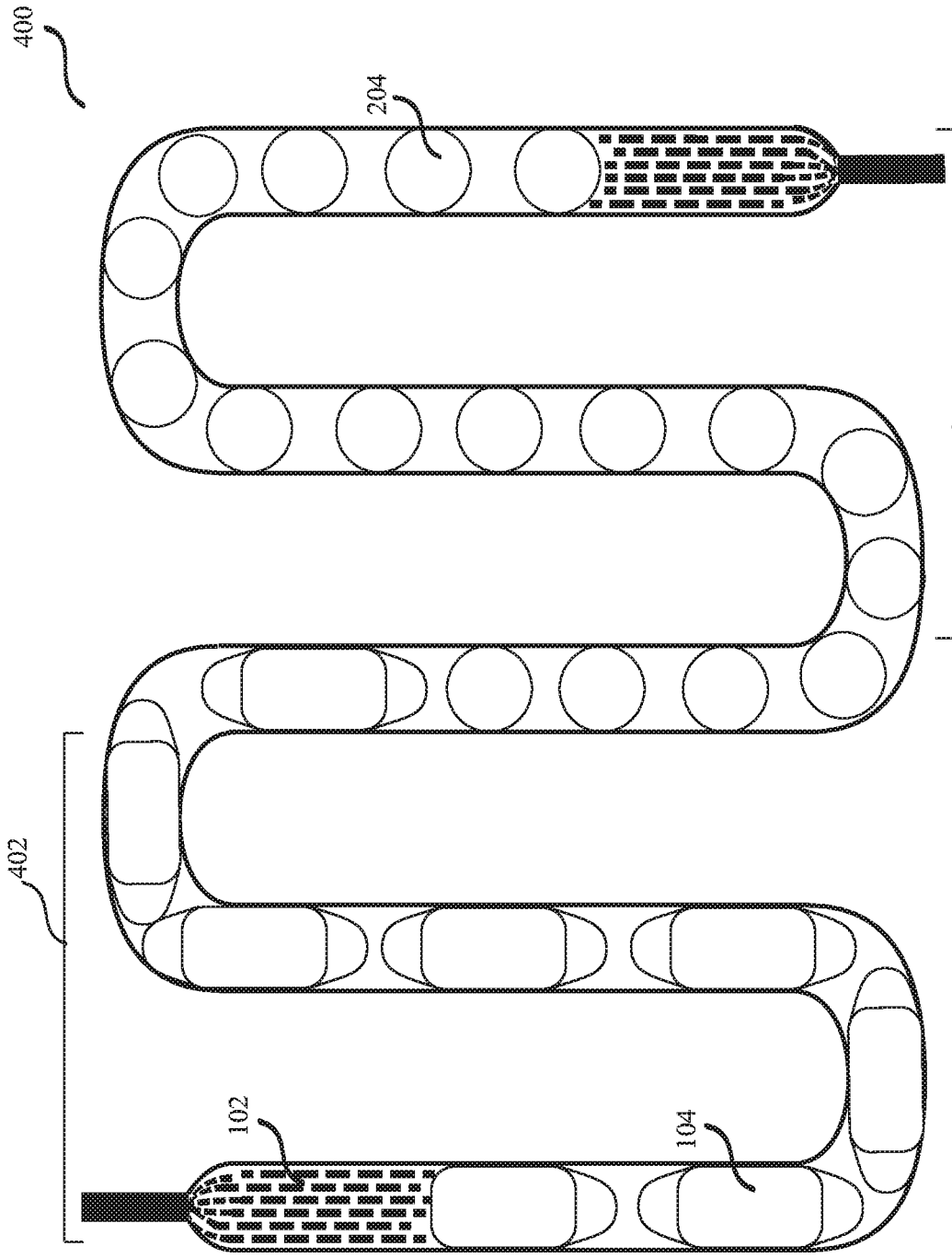

FIG.4

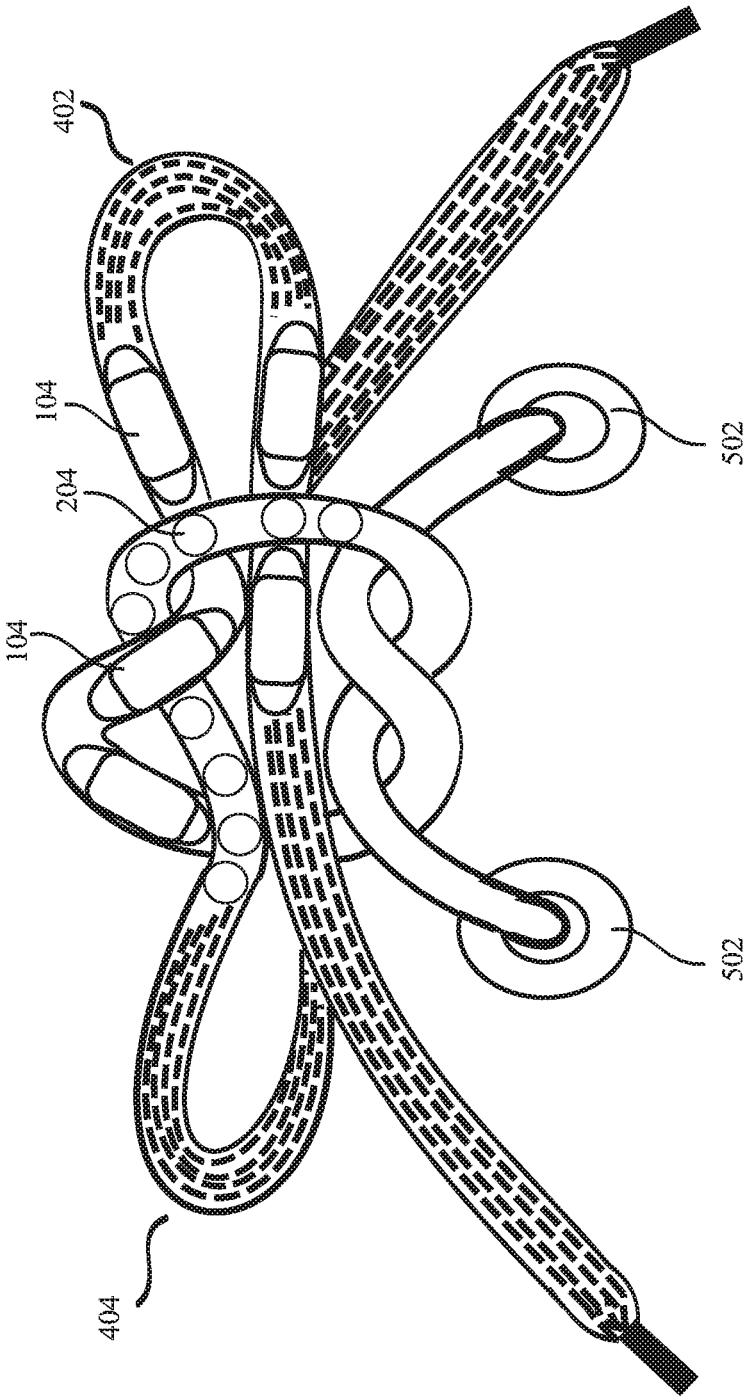

FIG.5

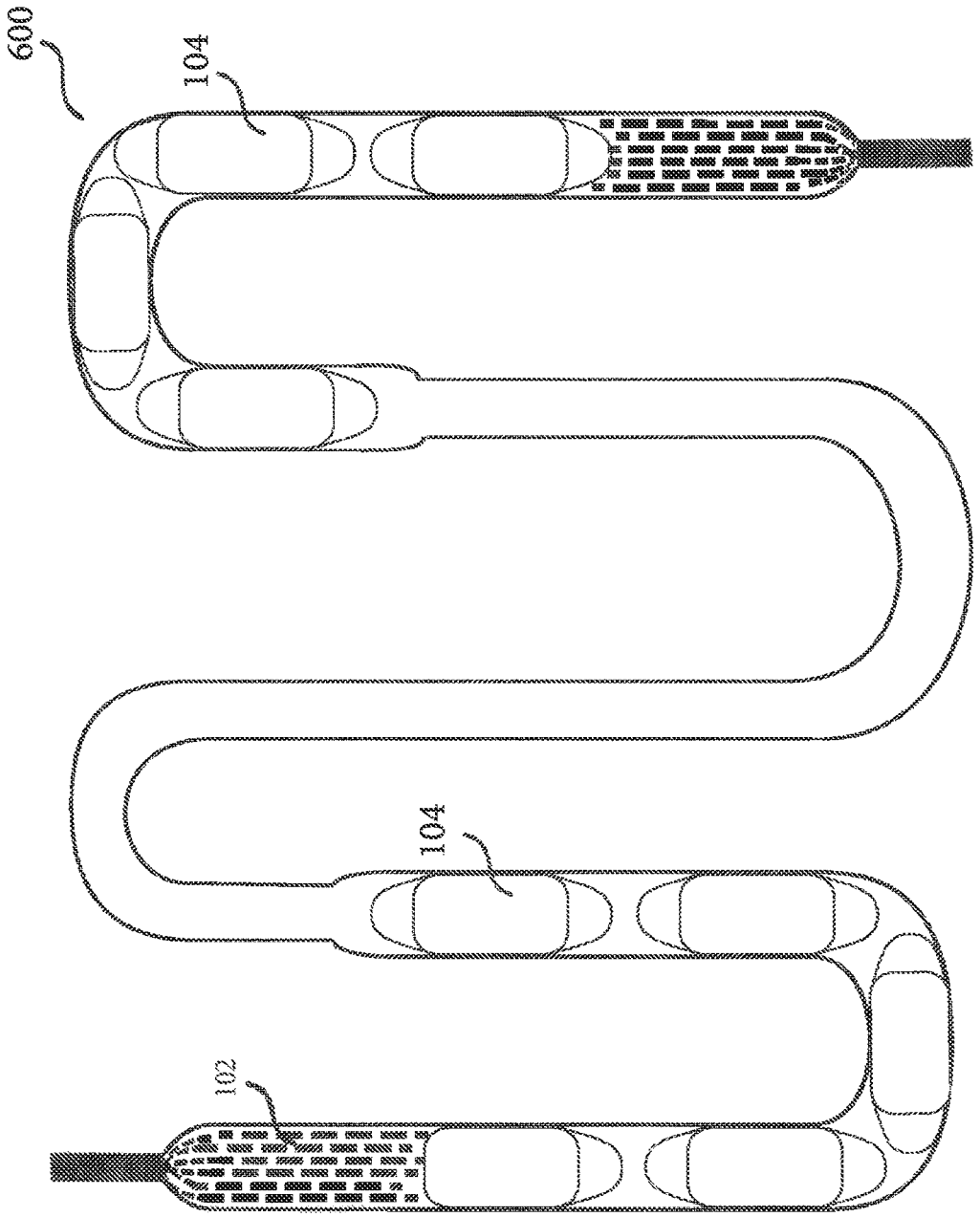

FIG.6

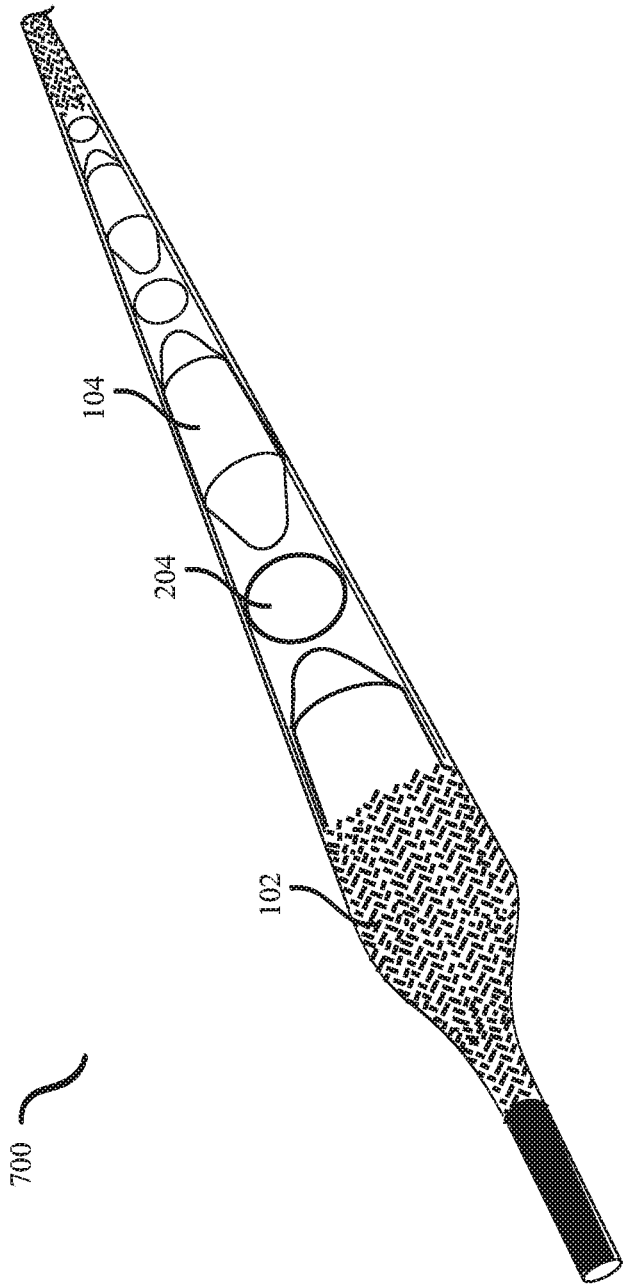

FIG.7

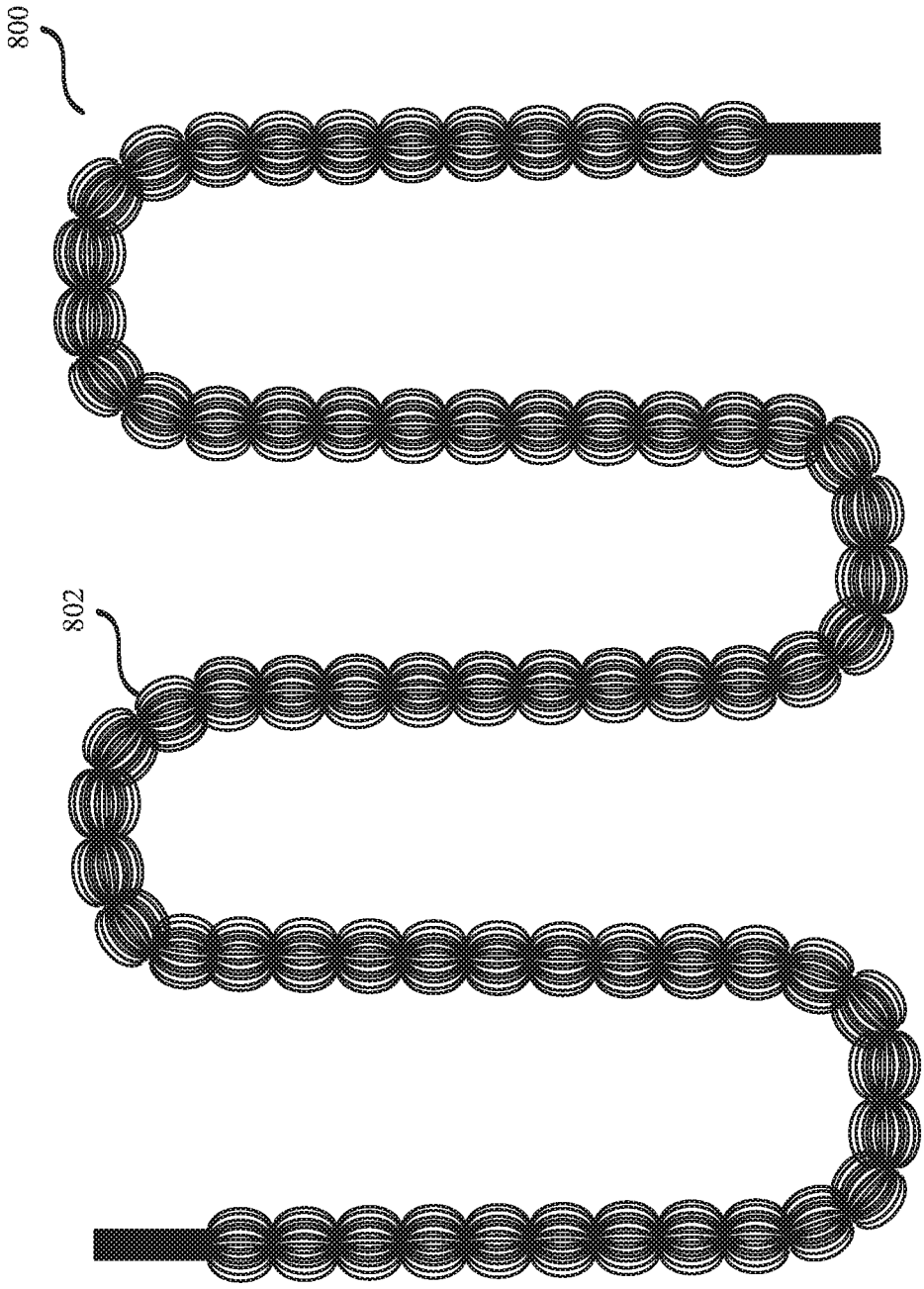

FIG.8

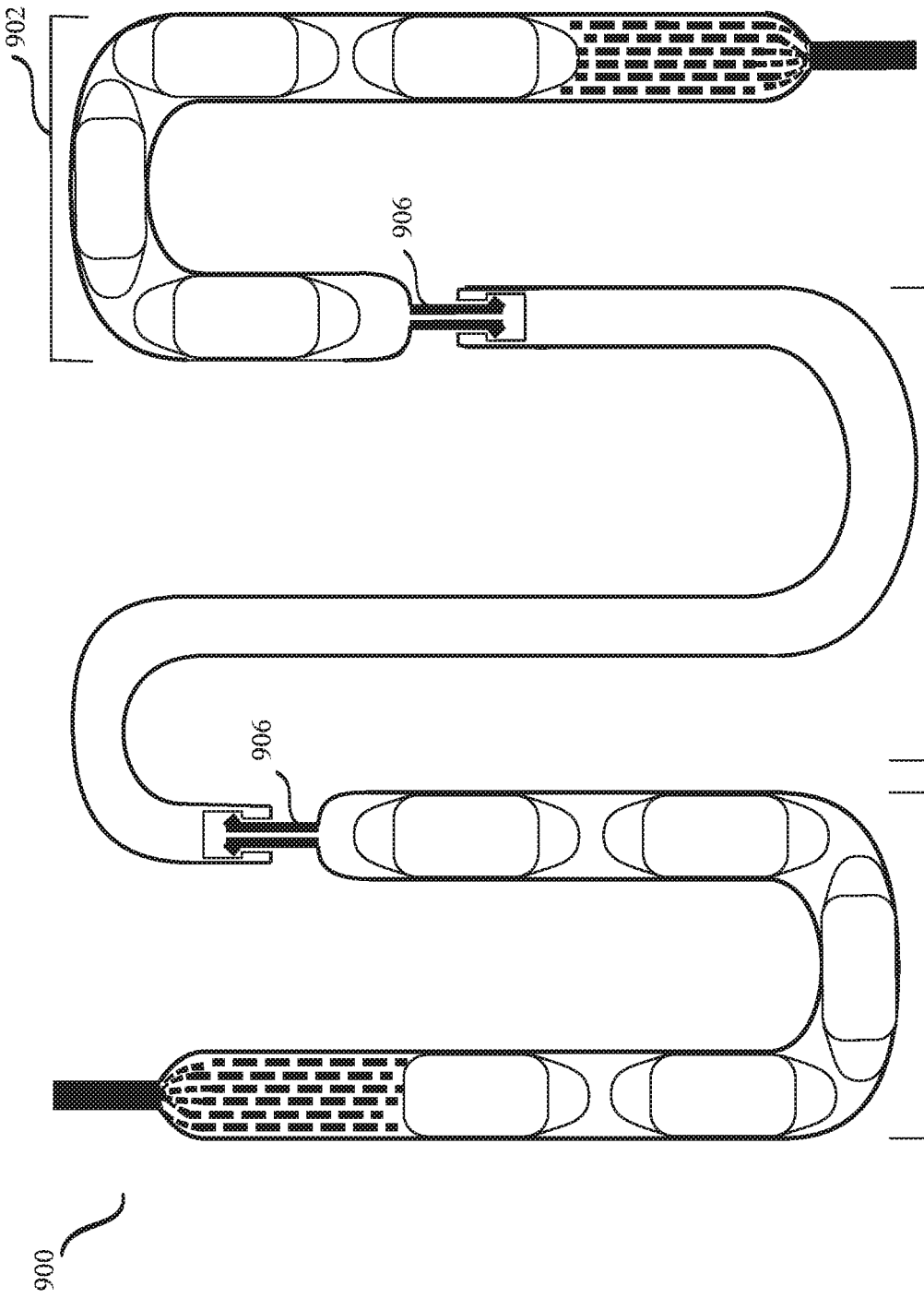

FIG.9

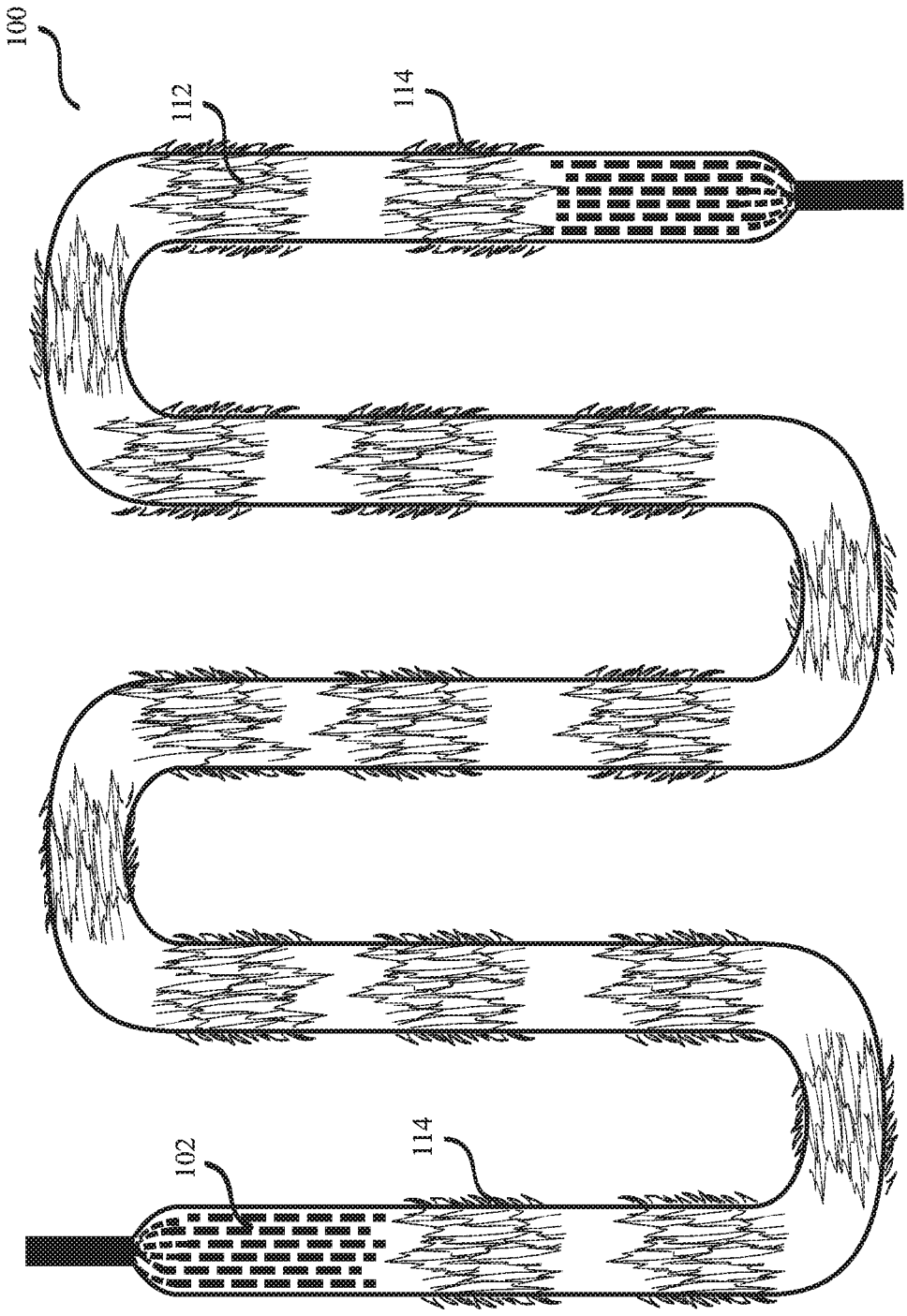

FIG.10

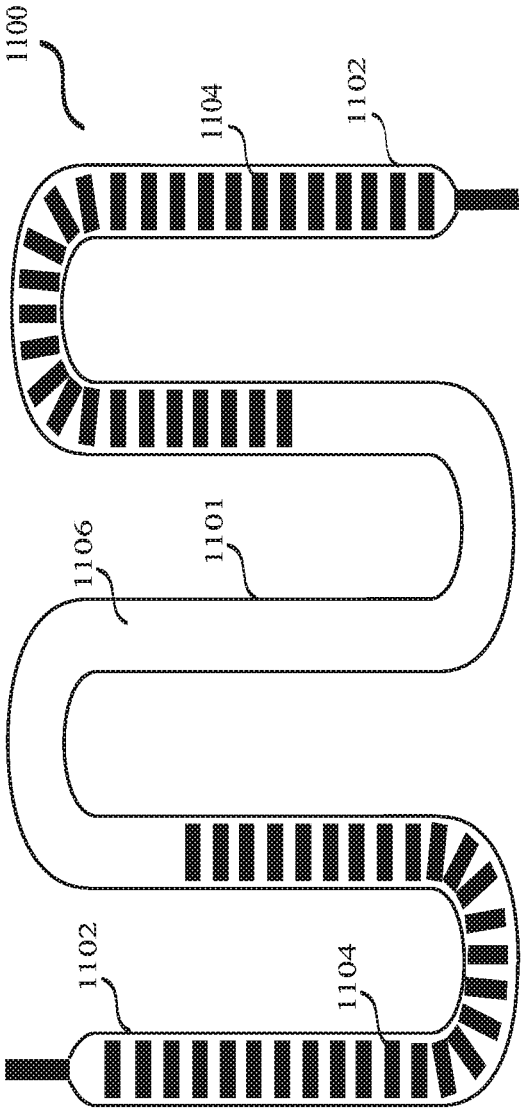

FIG.11A

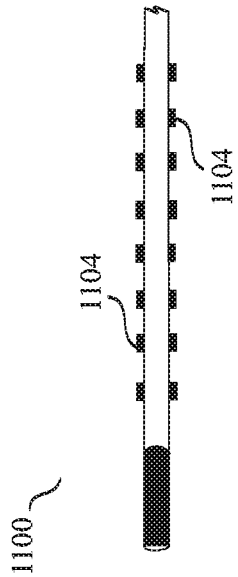

FIG.11C

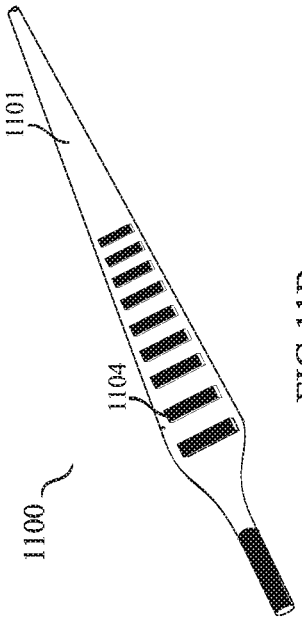

FIG.11B

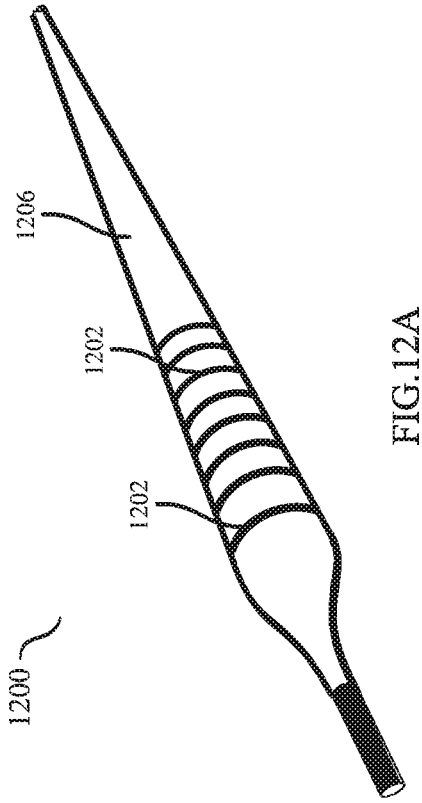

FIG.12A

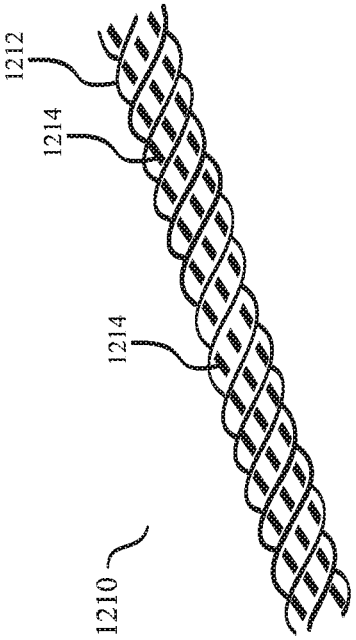

FIG.12B

SLIP RESISTANT SHOELACE AND CORD

REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. patent application Ser. No. 14/689,116, filed Apr. 17, 2015, entitled "A Slip Resistant Shoelace". The aforementioned application is hereby incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to shoelaces and cords. More particularly, the present invention is related to shoelaces and cords that resist unintentional untying of a knot.

BACKGROUND OF THE INVENTION

There are many needs for shoelaces of all types, such as hiking boots with long heavy duty laces and dress shoes with shorter thin laces and many types of shoes or skates or other equipment with laces of similar descriptions in between. Typical sneakers used for athletes and children are very popular around the world and most use laces that go through grommets/eyelets or similar load leveling devices (holes along the left and right side of the middle of the upper along the forefoot area) and are tied off after adjustment near the top of the foot. This set up is largely ubiquitous across all shoe types and across all countries of the world due to its simplicity, cost, and function. The typical shoelace system has one serious weakness, as the normal Bowknot which is also known as the Around The Tree or Traditional Knot, or any one of the other common knots of which there are approximately eighteen common knots used in shoelace tightening, is easily foiled, usually coming undone by itself (lack of firm closure on the knot), or by the users foot stepping on a loose end that was too long due to uneven tying, or due to other circumstances. There are several methods and apparatus on the market to overcome this major weakness of the traditional lace system. Some of the methods include "double knotting" which is a poor solution because the adult or child cannot easily untie the double knot when it comes time to remove the shoe. Other apparatus have been invented with poor results. Most require an "extra step" such as clipping a plastic or metal clip on the knot which can become detached and lost and which detracts from the attractive design of the product, or tucking the laces into special holders sewn into the shoe or other methods, all which are either inadequate or require a behavioral change and additional training.

Some sneakers and shoes specifically targeted to the very young and old and infirm use "Velcro" type hook and loop fasteners to overcome the users' inability or inconvenience of tying a knot in a traditional lace. These shoes use a "Velcro" brand or other brand of "hook and loop" quick fastener instead of traditional laces on the fore foot. This type of fastening system is typically provided in single (small shoes) or double (most others) straps that traverse across the forefoot area in a flap configuration which allows for quick and easy "release" and "tighten" actions, even allowing for one handed release and tighten. These hook and loop straps are useful for their intended purpose, however their unsightly design is unacceptable for designers and style conscious designers and is unacceptable for athletes who need even lacing tension afforded by the traditional lacing set up. Furthermore it is not good for a child to rely on the hook and loop fastener as the child grows up because

eventually there will be shoes that do not offer that type of closure system and the child must learn to tie a proper knot.

The typical shoes with its laces going through 2 to 7 or more pairs of opposing grommets for supportive lacing are the most common type worldwide and are generally more anatomically and physically supportive than a sandal, beach flip-flop or canvas casual shoe, and yet less supportive than a heavy duty hiking boot or skate-boot. These supportive shoes are especially necessary for older people who may have become slightly unsteady on their feet and/or wish to avoid stumbling on a pebble or other obstacle and utilize high quality supportive foot wear with even lacing and good high traction soles as an enabler for a more active lifestyle well into the senior years. Likewise toddlers just learning to walk and young adults alike have such active lifestyles with day care, camps, team sports and other activities that require adequate support for their growing feet which is in part provided by the traditional lacing system and adequate traction and support to prevent injury. Likewise various athletes, such as runners, bikers, soccer and the like require specialized high support high cushion athletic footwear which often includes low friction rings as grommets to allow the shoe upper to be tightened around the forefoot for support, and yet flex and give and take tension supplied by the lace during use, which also is best served by a traditional lace system but one that is augmented so as to not inadvertently untie during a critical sporting moment. Ironically, a sport that requires high quality high support footwear is the Triathlete, who starts out swimming with no shoes, but when transitioning from swimming to bicycling to running they require adequate footwear. In order to ease the transition from shoe-less to shoed, the triathletes perform all sorts of practice and rituals, such as lining shoes with silk socks to ease transition of wet feet into the shoe, to reduce the transition time from shoeless swimming to shoed bicycling and running. Once the shoe is on, they quickly tie it and go. The triathlete can be injured or lose valuable time if either shoe becomes untied during the sport, however there is little time to properly tie the shoelace and often wet or hurried hands tie a poor knot which comes undone.

These various groups of people and more all require supportive cushioning footwear with a traditional lace system, but also need the laces to remain tied throughout the normal daily activities without the stress and worry of the laces becoming untied inadvertently. Additionally, young people such as a 9 year old child typically exhibits laziness with shoe adornment behavior which is most typically the act of shoving the foot into an unprepared shoe with a tied forefoot due to a double or triple tie knot which is too difficult to untie. The shoe is quickly damaged because the foot is forced on while the laces are still tied, often with the inner support material of the heel counter being crushed thereby ceasing to provide support, ceasing to fit and align properly around the heel and ankle due to malformation.

The elderly exhibit nearly the same problems as the child, but not out of laziness or inability to understand, but due to body stiffness and lack of agility that comes with age they often have trouble tying and untying, and can become frustrated or put in peril if a shoe becomes untied at an inopportune time. Many elderlies get help tying laces in the morning and rely on those laces staying tied all day long, however they are often completely unable to untie a double knot if one is used.

Many of today's strongest ropes or cords are made of synthetic materials that are often hard and slippery and it is difficult to maintain a tight knot with these ropes. The older materials used hundreds of years ago, such as hemp and

cotton have a naturally rough surface that makes knot tying more productive hut are still prone to untying.

Therefore, there is a need for shoelaces and cords and ropes which can be tied using a traditional knot but with increased assurance that the traditional knot (with no doubling) will stay knotted securely unless untied by the user. Also, a need exists for a rope or cord that resists slip and minimizes inadvertent untying of knot or slipping through equipment used in industrial or camping or sailing or other activities that rely on user applied knots to cords.

OBJECTS OF THE INVENTION

An object of the present invention is to provide a shoelace that resists inadvertent untying of shoelace knot, referred to as slip resistant shoelace.

Another object of the present invention is to provide an anti slip shoelace which can be used in traditional way.

Yet another object of the present invention is to provide a slip resistant shoelace that can be used with conventional shoes instead of common type of shoelaces.

A further object of the present invention is to provide a slip resistant shoelace that does not require any external device for maintaining a shoelace knot.

A still further object of the present invention is to provide a slip resistant shoelace that contains shapes which increase the friction and bond within a shoelace knot and increases the tension required to untie the shoelace knot.

Another object of the present invention is to provide a slip resistant shoelace that contains surface treatments which increase the friction and bond within a shoelace knot and increases the tension required to untie the shoelace knot.

Yet another object of the invention is to provide an untie and slip-resistant cord.

These as well as other objects of the present invention are apparent upon inspection of this specification, including the drawings and appendices attached hereto.

SUMMARY OF THE INVENTION

The following presents a simplified summary in order to provide a basic understanding of some aspects of the disclosed invention. This summary is not an extensive overview, and it is not intended to identify key/critical elements or to delineate the scope thereof. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

The present invention is directed to an untie resistant shoelace that can be tied and untied in the traditional manner using simple hand motions already known by most of the people, but resists untying and stays more secure during various activities and accidental pulls to the knot system or to the loose ends of a shoelace.

The slip resistant shoelace of the present invention is designed to require little or no major changes to the shoe design and existing lacing system and lacing methods, and yet, once tied, requires greater force to untie than traditional shoelaces.

The slip resistant shoelace includes a shoelace tube inside of which a plurality of beads or pellets are arranged. Any suitable material such as a fabric can be used to fabricate the shoelace tube. The beads or pellets can be made from any suitable material such as plastic or rubber and the size and shape of the beads or pellets can vary depending on the intended use of the slip resistant shoelace. When a knot is tied, wherever the opposite ends of the slip resistant shoelace cross over each other in the knot, the one or more beads present inside one of the ends of the slip resistant shoelace try to fit in between two consecutive beads present in the opposite end of the shoelace. This engagement among the beads belonging to the opposite sides of the shoelace makes it difficult to untie the shoelace until a user makes use of his hands to do so and the present invention is based on this principle.

To the accomplishment of the foregoing and related ends, certain illustrative aspects of the disclosed invention are described herein in connection with the following description and the annexed drawings. These aspects are indicative, however, of but a few of the various ways in which the principles disclosed herein can be employed and is intended to include all such aspects and their equivalents. Other advantages and novel features will become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to describe the manner in which features and other aspects of the present disclosure can be obtained, a more particular description of certain subject matter will be rendered by reference to specific embodiments which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments and are not therefore to be considered to be limiting in scope, nor drawn to scale for all embodiments, various embodiments will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

FIG. **1** is a perspective view of a part of a slip resistant shoelace with elongated beads in accordance with an embodiment of the present embodiment;

FIG. **2** is a plan view of a full length slip resistant shoelace with elongated beads in accordance with an embodiment of the present embodiment;

FIG. **3** is a perspective view of a part of a slip resistant shoelace with round beads in accordance with an embodiment of the present embodiment;

FIG. **4** is a plan view of a full length slip resistant shoelace with elongated and round beads in accordance with an embodiment of the present embodiment;

FIG. **5** illustrates a slip resistant shoelace in knotted condition in accordance with an embodiment of the present embodiment;

FIG. **6** is a plan view of a full length slip resistant shoelace suitable for factory fit with shoes in accordance with an embodiment of the present embodiment;

FIG. **7** is a perspective view of a part of a slip resistant shoelace with combination of elongated beads and round beads in accordance with an embodiment of the present embodiment;

FIG. **8** is a plan view of a full length slip resistant shoelace with woven beads in accordance with an embodiment of the present embodiment;

FIG. **9** is a plan view of a full length three piece slip resistant shoelace in accordance with an embodiment of the present embodiment;

FIG. **10** is a plan view of a full length slip resistant shoelace with friction inducing material sewn, woven, glued or staked along the periphery of the shoelace tube in accordance with an embodiment of the present invention.

FIG. **11**A is a plan view of a full length slip resistant shoelace having transversely disposed friction inducing material in accordance with an embodiment of the present embodiment;

FIG. **11**B is a perspective view of the slip resistant shoelace of FIG. **11**A;

FIG. **11**C is a side view of the slip resistant shoelace of FIG. **11**A;

FIG. **12**A is a perspective view of a slip resistant shoelace having transversely disposed ring-shaped friction inducing material in accordance with an embodiment of the present embodiment; and

FIG. **12**B is a perspective view of a slip resistant cord having a plurality of bumps as friction inducing material in accordance with an embodiment of the present embodiment.

DETAILED DESCRIPTION OF THE INVENTION

The following description is presented to enable any person skilled in the art to make and use the invention, and is provided in the context of particular applications of the invention and their requirements. Various modifications, for example but not limited to changes made to ease manufacturing, to the disclosed embodiments will be readily apparent to those skilled in the art and the general principles defined herein may be applied to other embodiments and applications without departing from the scope of the present invention. Thus, the present invention is not intended to be limited to the embodiments shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood by those skilled in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures and components have not been described in detail so as not to obscure the present invention.

Those of ordinary skill in the art will realize that the following detailed description of the present invention is illustrative only and is not intended to be in any way limiting. Other embodiments of the present invention will readily suggest themselves to such skilled persons having the benefit of this disclosure. Reference will now be made in detail to implementations of the present invention as illustrated in the accompanying drawings. The same reference indicators will be used throughout the drawings and the following detailed description to refer to the same or like parts.

In the interest of clarity, not all of the routine features of the implementations described herein are shown and described. It will, of course, be appreciated that in the development of any such actual implementation, numerous implementation-specific decisions must be made in order to achieve the developer's specific goals, such as compliance with application- and business-related constraints, and that these specific goals will vary from one implementation to another and from one developer to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking of engineering for those of ordinary skill in the art having the benefit of this disclosure.

The slip resistant shoelace of the present invention comprises of a shoelace tube and one or more friction inducing features integrated to the shoelace tube. The term "slip resistant" refers to a knot that requires more tension applied to the lose aglet ends or to the bows or to the shoe to untie than the same knot made in a similar shoelace without the friction inducing features. Examples of different options for integrating friction inducing features to the shoelace tube include, but are not limited to, inclusion of different shaped structures (e.g. beads) inside the shoelace tube, making bump like structures on the shoelace tube itself, adding friction inducing surface such as serrated edges, barbs, hooks or adhesive or friction inducing surface treatments to the exterior of the shoelace tube etc. These friction inducing features increase the friction between two surfaces of the shoelace tube in contact in a knot and, thus, resist loosening of the knot. In other words, the friction inducing features increase the tension or pull that is required to untie a knot. Some of these friction inducing features are described below with reference to drawings. In the ensuing description, the terms anti-slip shoelace and slip resistant shoelace are used alternative and interchangeably.

FIG. **1** illustrates a perspective view of a slip resistant shoelace **100** in accordance with an embodiment of the present invention. Reference to FIG. **1**, the slip resistant shoelace **100** of the present invention comprises of a shoelace tube **102** and plurality of beads **104**. The shoelace tube **102** can be woven using any commonly used fabric—polyester or cotton or can be fabricated using any other suitable material known in the art. The plurality of beads **104** are sewn or glued inside the shoelace tube **102** at some regular or irregular intervals. FIG. **2** illustrates a plurality of beads **104** spaced at regular equal intervals inside the shoelace tube **102** throughout the length of the slip resistant shoelace **100**. The beads **104** can be of any size and shape. The beads **104** can have rounded or squared ends. Beads aligned inside the shoelace tube **102** with rounded ends facing the aglet end help in feeding the shoelace though the eyelets and the square end of beads facing away from the aglet end help in resisting relative movement between two beads in engaged position. In the embodiment of the slip resistant shoelace **100** shown in FIG. **1** elongated beads **104** are used with rounded ends on both sides of the beads **104**. The beads **104** can be made from any suitable material such as rubber, glass, plastic, wood, metal, viscoelastic silicone etc. known in the art. In a preferred embodiment, the beads **104** should be approximately 0.14 inch to 0.177 inch in diameter, made of rubber and the beads **104** should have hardness in the range of 40 international rubber hardness degrees (IRHD) to 80 IRHD.

FIG. **3** shows another embodiment of the slip resistant shoelace **100** in which a plurality of rounded beads **204** are sewed or glued inside the shoelace tube **102**. In a preferred embodiment, as shown in FIG. **4**, the plurality of elongated beads **104** are lined inside first half **402** of the shoelace tube **102** whereas plurality of rounded beads **204** are lined up inside the second half **404** of the shoelace tube **102** of the slip resistant shoelace **400**. FIG. **5** shows the intended use of the slip resistant shoelace of the present invention. As shown in FIG. **5**, when the slip resistant shoelace **400** is passed through the eyelets **502** of a shoe and a knot is tied using the free ends of the first half **402** and the second half **404**, the beads of one half of the slip resistant shoelace **400** get interlocked with those of other half of the shoelace where the shoelace ends cross each other in a tightened knot. The beads of the same half of the shoelace can also get interlocked with each other when two sections of the same half of the shoelace remains pressed against each other. For example, as shown in FIG. **5**, one or more beads **104** of first half **402** of slip resistant shoelace **400** may fall in the space provided between two consecutive beads **204** of the second half **404** of slip resistant shoelace **400** at the points where the shoelace ends pass over or cross each other and in close contact. Similarly, in the same knot, wherever the portions of the

shoelace **400**, of the same shoelace end or of the opposite ends, remain pressed against each other, the beads **104** and **204** would try to fill-in the spaces available between two consecutive beads in the opposite portion of the shoelace **400**. The engagement of beads **104** and **204** with each other occurs in a manner similar to a male-female interlocking and this engagement offers resistance against slipping of the ends of a shoelace **400** relative to each other in a knot once the knot is tightened, thereby preventing inadvertent untying or loosening of a knot. The size and shape of the beads and the interval provided between two consecutive beads are designed to ensure that whenever two sections of the slip resistant shoelace of the present invention cross over each other in a knot, one or more beads of one section of the slip resistant shoelace always find space to fit in between two or more beads of the opposite section of the shoelace. All the different embodiments of the slip resistant shoelace of the present invention work on this same principle of interlocking beads or bumps or to resist loosening or slipping of a knot.

FIG. **6** illustrates a slip resistant shoelace **600** suitable for factory fit with shoes. As shown in the FIG. **6**, the middle section of the slip resistant shoelace **600** is made as a normal shoelace excluding any beads or bumps and this middle portion goes through the multiple eyelets of a shoe. The end sections of the slip resistant shoelace **600** are made similar to the shoelaces shown in FIG. **1** through FIG. **4** with plurality of beads **104** sewn or glued inside the shoelace tube **102** and these end sections remain loose outside the uppermost eyelets of a shoe.

FIG. **7** illustrates another embodiment of the present invention wherein slip resistant shoelace **700** has plurality of beads of different shapes and sizes lined inside the shoelace tube **102**. In FIG. **7**, plurality of beads **104** and **204** are arranged alternatively inside the shoelace tube **102**. Similarly, various combinations of differently designed beads can be arranged inside the shoelace tube **102** in other embodiments of the present invention.

In some embodiments of the slip resistant shoelace of the present invention, the shoelace tube itself can be woven or melt staked to have a plurality of uneven cross-sections along the length of the shoelace tube at regular or irregular intervals. Examples of such uneven cross-sections include, but are not limited to, bumps of various sizes and shapes without using beads inside the shoelace tube. For example, as shown in FIG. **8**, the slip resistant shoelace **800** can be woven to have bumps **802** throughout the length of the shoelace **800** at regular intervals. These bumps **802** of the ends of shoelace **800** will engage with each other in a knot and resist loosening of the knot.

In some shoes it may be difficult to pass the slip resistant shoelaces through the eyelets if the beads or bumps of the slip resistant shoelaces are bigger in size than the eyelets. To overcome this problem, beads made of elastic material may be used so that the beads can be squeezed through the eyelets and the beads regain their shape thereafter. In case of embodiments similar to the one shown in FIG. **8**, the shoelace tube can be fabricated from elastic material so that the bumps can pass through eyelets smaller than the bump size.

In some shoes it may be difficult to pass the slip resistant shoelaces through the eyelets if the beads or bumps of the slip resistant shoelaces are bigger in size than the eyelets, or for other design purposes it is desired to avoid beads. In an alternative embodiment, to overcome this problem, friction inducing features are sewn, woven, staked or glued into the periphery of the shoelace tube material. As shown in FIG. **10**, friction inducing material **112** having barbs or serrated edges **114** is added to the exterior of the shoelace tube **102**. These pluralities of serrated edges **114** from the sections of the shoelace tube **102** in contact in a knot interlock with each other and resist slipping from the knot. FIGS. **11**A to **12**B show shoelace and cord of the present invention having friction inducing features disposed over the outer surface of the shoelace tube and the cord in the form of pluralities of bumps (hereinafter the terms protuberances, projections, bumps and strips are used interchangeably and alternatively as those are all different types of friction inducing features added to the surface of the shoelace or cord through surface treatment process) which have coefficient of friction greater than the surface of the standard shoelace tube. These friction inducing features increase the frictional resistance when those come in contact or interact or interfere with each other or with any other surface and resist slipping of the shoelace or cord. Depending on the size and shape of the friction inducing features (such as block shaped friction inducing feature), the slip resistance may result from the increased friction and/or interaction/interference due to interlocking of the bumps. In the shoelace **1100** of FIG. **11**A, bumps **1104** are disposed transversely along the outer surface of the shoelace tube **1101**. In some embodiments, the bumps **1104** can be disposed along at least a portion of the entire length of the shoelace while in others the bumps can be disposed along the entire length of the shoelace tube or the middle section **1106** of the shoelace can be left blank with bumps **1104** disposed only over the end portions **1102** as shown in FIG. **11**A. As shown in FIG. **11**C, the bumps **1104** can be provided on both sides of the shoelace tube when the tube is flat in cross-section. The bumps can transversely cover the whole periphery of the shoelace tube or those can be disposed in non-contiguous manner. In some embodiments, the bumps can be disposed over the shoelace tube aligned longitudinally along at least a portion of the length of the shoelace in a contiguous or non-contiguous manner. The bumps **1104** can be made of rubber, silicone or any other material that is flexible and can increase frictional resistance. These bumps can be adhered, glued, stitched, printed, woven-in or otherwise made part of the shoelace tube or cord. The size, shape and distance between two consecutive bumps can be adjusted according to the required amount of slip-resistance. In some embodiments, a layer of rubber or silicone can be applied all over the exterior of the shoelace tube or over certain portions of the shoelace tube. When the bumps come into contact with the shoelace tube or with other bumps in a knot, owing to the high co-efficient of friction provided by the rubber bumps, slip is minimized and the knot remains tight.

FIG. **12**A shows an embodiment of the slip-resistant shoelace **1200** wherein the shoelace tube **1206** is cylindrical (i.e. tubular or round cross-section) and the bumps **1202** are disposed transversely in ring-shaped or round form. In some embodiment, the bumps can be disposed in a helical manner over the shoelace tube or cord.

In some embodiments, the working principles of the above-mentioned slip-resistant shoelaces are applied to produce slip-resistant cords (the term "cords" includes ropes, cords, lines, strands, cables, strings etc.). In fact, a cord produced in accordance with the principles of the present invention, can be used as a shoelace or as a cord for other purposes such as, but not limited to, camping and other outdoor or indoor activities and equipment. Maintaining a tight knot in a cord has always been a problem in many applications. In accordance with the present invention, the outer surface of a cord can be made to offer higher co-

efficient of friction against slippage if a friction inducing material such as rubber or silicone is added to the outer surface of the cord compared to the friction of the unadorned material of the cord. FIG. **12**B illustrates such a slip-resistant cord **1210** wherein a plurality of friction inducing rubber or silicone bumps **1214** are added to the outer surface **1212** of the cord. These friction inducing features increase the frictional resistance between two or more surfaces of the cord which remain in contact in a knot and resist loosening of the knot. These designs can also help the functioning of the cord in other types of equipment, such as a windlass even if no knot is applied as the bumps increase the frictional resistance and interaction when those come into contact with surface of the equipment.

In another embodiment, the slip resistant shoelace **900** of the present invention can have a plurality of detachably attachable sections with beads sewn or stacked inside the shoelace tube of some of the sections and with smooth conventional shoelace body without having beads or bumps for some other sections. This embodiment of the present invention is particularly suitable for retrofit in shoes (aftermarket) or to overcome the small eyelet problem. As shown in FIG. **9**, the middle section **904** of the slip resistant shoelace **900** is made like a normal conventional shoelace without having any beads inside or bumps so that section **904** can easily pass through the eyelets of a shoe. The end sections **902** of the slip resistant shoelace **900** can then be attached to the ends of the middle section **902** to form the loose ends of shoelaces. As shown in FIG. **9**, snap fit type of locking arrangement **906** can be used for attachment of the end sections **902** to the middle section **904**.

It is evident from the above description that the slip resistant shoelace of the present invention does not entail any change in the design of a shoe and also requires no extra accessory to keep a shoelace knot intact and tight.

When introducing elements or features of the present disclosure and the exemplary embodiments, the articles "a", "an", "the" and "said" are intended to mean that there are one or more of such elements or features. The terms "comprising", "including" and "having" are intended to be inclusive and mean that there may be additional elements or features other than those specifically noted. It is further to be understood that the method steps, processes, and operations described herein are not to be construed as necessarily requiring their performance in the particular order discussed or illustrated, unless specifically identified as an order of performance. It is also to be understood that additional or alternative steps may be employed.

It is specifically intended that the present invention not be limited to the embodiments and illustrations contained herein and the claims should be understood to include modified forms of those embodiments including portions of the embodiments and combinations of elements of different embodiments as come within the scope of the following claims.

What is claimed is:

1. A slip resistant shoelace, comprising:

a shoelace tube; and

a plurality of bumps integrated with said shoelace tube, said plurality of bumps having a coefficient of friction greater than said shoelace tube without bumps;

wherein said plurality of bumps are integrated with said shoelace tube by one of: (i) being woven through a surface of said shoelace tube; and (ii) being adhered to the surface of said shoelace tube;

wherein said plurality of bumps increase frictional resistance and resist loosening of a knot tied with said shoelace when said plurality of bumps interact with each other in said knot, or with any other surface;

wherein said shoelace tube has a flat cross section with two sides; and

wherein said plurality of bumps are disposed on at least one side of said shoelace tube.

2. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are disposed over said shoelace tube in a helical manner.

3. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are disposed transversely over said shoelace tube.

4. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are disposed in a non-contiguous manner.

5. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are disposed in a contiguous manner over said shoelace tube.

6. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are disposed on two sides of said shoelace tube.

7. The slip resistant shoelace as in claim **1**, wherein said plurality of bumps are formed by the shoelace tube being woven to have the plurality of bumps.

8. A slip resistant cord, comprising:

an outer surface of said cord; and

a plurality of bumps integrated with said cord, said plurality of bumps having coefficient of friction greater than said outer surface without bumps;

wherein said plurality of bumps are integrated with the outer surface of said cord by one of: (i) being woven through the outer surface of said cord; and (ii) being adhered to the outer surface of said cord;

wherein said plurality of bumps increase frictional resistance when said plurality of bumps come in contact or interact or interfere with each other or with any other surface;

wherein said cord has a flat cross section with two sides; and

wherein said plurality of bumps are disposed on at least one side of said cord.

9. The slip resistant cord as in claim **8**, wherein said plurality of bumps are disposed over at least a portion of said cord.

10. The slip resistant cord as in claim **8**, wherein said plurality of bumps are disposed transversely over said outer surface.

11. The slip resistant cord as in claim **8**, wherein said plurality of bumps are disposed in a non-contiguous manner.

12. The slip resistant cord as in claim **8**, wherein said plurality of bumps are disposed in a contiguous manner over said outer surface.

13. The slip resistant cord as in claim **8**, wherein said plurality of bumps are disposed on two sides of said cord.

14. The slip resistant cord as in claim **8**, wherein said plurality of bumps are formed by the cord being woven to have the plurality of bumps.

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